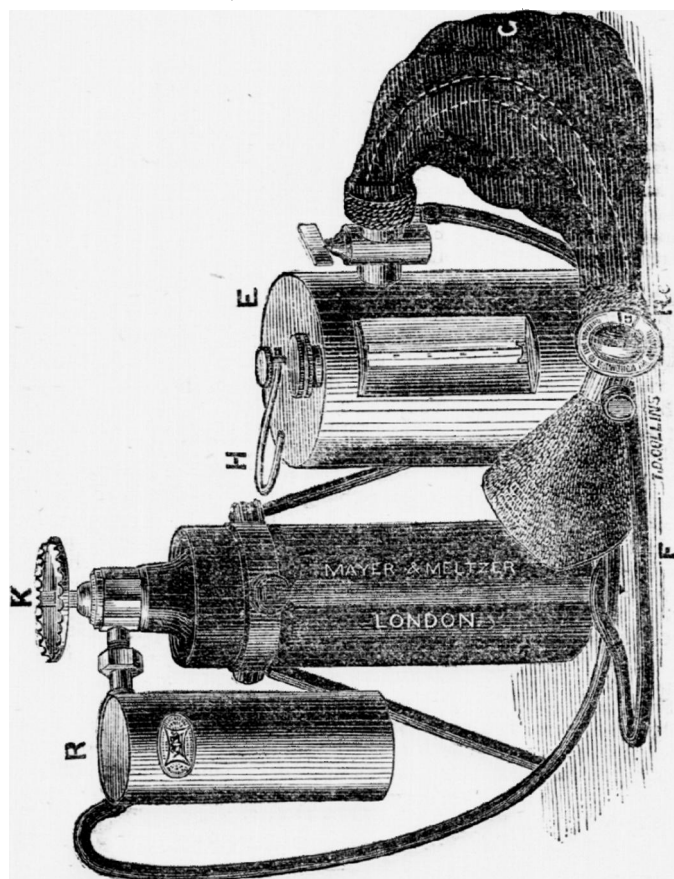


# ON AN APPARATUS FOR ADMINISTERING NITROUS OXIDE GAS AND ETHER, SINGLY OR COMBINED.

By J. T. CLOVER, F.R.C.S.

FOR several years, my attention has been directed to the improvement of the way of administering ether. At first, I spared the patient the unpleasant choking sensation of ether by first getting him asleep with chloroform. My next plan was to dilute the ether-vapour with a known proportion of air, the supply of ether-vapour being rendered more uniform by attention to its temperature, which was kept within limits by causing the expired air to pass through the ether-vessel in a kind of worm. I called this the double-current apparatus, and showed it at the meeting of the British Medical Association in London, in 1873. At the same time, I explained the two methods I had used for giving gas preparatory to ether. By the first plan, I simply exchanged the gas-inhaler for the ether-inhaler as soon as the patient was unconscious. By the second, I caused the current of gas to pass through a vessel of ether, after the first three or four respirations of pure gas had made the patient indifferent about its taste. This plan answered very well for cases not requiring more than three or four minutes' anæsthesia; but I found it difficult to supply sufficient air to prevent muscular twitching, without admitting enough to cause a return to partial consciousness.

The apparatus about to be described is, in principle, like the one shown at the Norwich Meeting in 1874, with some improvements. It has been used at St. Bartholomew's, University College, St. Mary's, and the Dental Hospitals; and I have myself placed under the influence of ether with it two thousand three hundred cases. The engraving represents the apparatus, taken out of a leather bag. I prefer keeping it in a tin-box, as the bottle is then fixed ready for use, and there is no need for a tripod.



F. Face-piece. Re. Regulator. G. India-rubber Bag. E. Ether Vessel.  
H. Hook to attach the latter to a Strap passing round the Neck. K. Foot  
Key. R. Gas Rarifier.

The apparatus is made by Mayer and Meltzer of Great Portland Street, and consists of a thin bag, oval in shape and fifteen inches long; at one end connected with the ether vessel, at the other with the face-

piece. Inside the bag, there is a flexible tube, also connected with the face-piece and ether vessel. By turning the regulator (Re), the patient is made to breathe, either directly into the bag, or indirectly through the tube and ether-vessel. When the letter G is visible, the way to the gas-bag is open; when the letter E is visible, the only way to the bag is through the tube and ether vessel, so that the more the regulator is turned towards E, the more ether is given, and *vice versa*. The other vessel contains a reservoir of water, to prevent the temperature of the ether becoming too low. This is to be kept full. The ether vessel is to be rather more than half filled, the precise point being marked against the glass gauge. A thermometer inside this gauge tells the temperature of the ether. Before using it, the vessel should be dipped into a basin of warm water, and rotated until the thermometer stands at about 68 deg. If the room be cold, and if the patient have thin cheeks and large whiskers, the temperature may be 73 deg. It is important that the face-piece should fit closely against the face. Those made by Mayer, of solid leather frame-work supporting a collar of inflated India-rubber, are the best, but sometimes they require to be warmed before using.

*For giving Nitrous Oxide only.*—The regulator is turned to G. The stopcock of the ether-vessel is closed. This vessel is hooked upon the strap round the neck. The strap is adjusted so that the ether-vessel stands at a higher level than the face-piece. The gas being turned on, by rotating the foot-key with the foot, the gas-bag is kept filled as fast as it is emptied by the patient. When the latter breathes out, the supply of gas is stopped; and after the bag is fully distended, the escape-valve opens, and allows the expired gas to escape. If the shape of the patient's face prevent the face-piece from fitting closely, the escape-valve should be closed by pressing it with the finger. Enough gas will escape beneath the face-piece during expiration; but the bag, being slightly distended, will yield the gas so abundantly that no air will be drawn in at the same place during inspiration.

*If Ether is to be used without Gas.*—The gas-tube should be taken off the ether-vessel; the regulator should be turned to G, and the face-piece should be first applied to the face during an expiration, and be held rather closer during expiration than during inspiration. It is important not to oblige the patient to inhale after the bag is empty, because, the barometric pressure of air on the ether being diminished, the vapour would increase in strength, and make the patient cough, or perhaps vomit. The regulator is gradually turned towards E, and thus the way is opened to the inner tube. The air breathed through it carries vapour from the vessel into the distal end of the bag. As soon as one-half of the air passes through the ether-vessel, the vapour becomes strong enough to cause insensibility in about two minutes, usually without any coughing. As the movement of swallowing is excited by a too strong, although less pungent, atmosphere than is generally needed to excite coughing, it should be watched for, and the regulator slightly turned back if it occur.

By far the easiest and least unpleasant way of getting a patient ready for a surgical operation is to use gas and ether combined; the gas being given pure during four or five respirations, and the ether gradually added as above described. The supply of gas should cease when the ether is turned on; but if during the operation we have admitted so much fresh air that the patient seems conscious of the taste of the ether, we may, instead of increasing the ether, give a liberal supply of gas until the patient is tranquil. I find less sickness, and less complaint of the taste of ether afterwards, than when ether is used alone. In operations on the eye, the muscular twitching and the panting character of the breathing, during the first few minutes of insensibility, are objectionable; but if the operation be not commenced for five minutes, and the ether given as strong as it can be taken without exciting a cough, the patient begins to breathe stertorously, and now the face-piece may be removed every third or fourth inspiration, and, as the stertor goes off, the eye will become quite steady. I am, however, so well satisfied with a modification of my chloroform apparatus, by which I can give as much of ether or chloroform as I like, that, when I have a choice, I prefer using these for cataract operations, and for the ligation of deep-seated arteries, etc. With respect to vomiting, I think it most important that the patient should have an empty stomach, and prefer that neither food nor drink of any kind should be taken for from four to six hours beforehand. I see least sickness after operations done before breakfast.

In using this apparatus, as in using others, the breathing and the pulse should be kept under observation. Whenever we see a patient swallow, it is probable he is taking the vapour stronger than is necessary, and the regulator should be turned back slightly. If the patient cough violently, remove the face-piece, and be sure that the apparatus has not been overheated, or filled with ether above the proper level. As soon as any muscular twitchings, like those of paralysis agitans, are seen,

give about a fourth of an inspiration of fresh air, and do not keep the face-piece quite close to the face till the twitchings have nearly ceased. I have never seen any harm result from the condition which causes these movements. If air were not given, they would increase, and then stop; the respiration would become intermittent, and, some time after this, the heart would cease to beat. The fact that death may be produced, if signs of danger are disregarded, applies to all anæsthetics. Whenever the breathing becomes jerking, sobbing, or intermittent, the face-piece should be removed, but applied directly the breathing loses that character, unless the pulse is much depressed. It is much less important to watch the pulse whilst giving gas and ether than in giving chloroform, but it is desirable; for, when it decidedly loses power, we may safely admit a little fresh air, and thus anticipate the need of removing the face-piece to a greater extent on account of muscular twitching or stertor. If the finger be taken from the pulse to do something else, I would give a little air, unless the patient had only just begun to inhale, or was evidently but slightly under the anæsthetic.

**Practical Suggestions.**—As the apparatus would be injured by an excited patient taking hold of it, it is as well to be on our guard by having an assistant near, in case of need. It is a good plan to place a handkerchief over a patient's eyes, and keep it there till he is asleep, and apply it again when he is about to awake. In operations on the rectum, it is desirable that the bandage required for keeping him on his side should be applied before giving the gas. Sudden distension and bursting of the gas-bag or gas-tube can scarcely happen when the gas-rarefier is used; but if this be not used, or if the gas-bottle have become frozen, it is desirable to warm the bottle, and in doing so the tap end should be more warmed than the other. Whenever there is much difficulty in getting the face-piece adjusted, it may be necessary to arrange a handkerchief or towel, so that the air drawn in under the face-piece may be nearly the same as that which was breathed out.

In conclusion, the *advantages of the Apparatus* are these:—1. It lessens the waste of ether, and consequently the odour of ether about the house. 2. The patient usually goes to sleep without any struggling, and is ready to be operated on in from one to two minutes. 3. The percentage of ether need not be so high as to produce coughing or swallowing, and it can be made stronger or weaker, as we wish, by merely turning a regulator. Lastly, patients recover rapidly, with less delirious excitement and less sickness, than if ether be given in the usual way.

## CASE OF FICTITIOUS DUMBNESS.

BY STAFF-SURGEON ROBERT NELSON, R.N.,  
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THE following case may be of interest to naval and military medical officers, as illustrating a somewhat uncommon form of feigned disease, and the failure of a generally supposed detective.

F. T., aged 17, a boy on board of a royal naval training ship, who had previously a better position, and consequently found his newly adopted profession somewhat irksome, was sent to me in the sick berth one morning at 8 o'clock, and made signs that he was unable to speak. He appeared pale, nervous, and semi-hysterical; but no other objective symptoms of disease were detected. By gesture and writing, he complained that when mustered for drill, he had been suddenly struck dumb, and that he had great pain in the left side of his head, extending from the eye towards the occiput, and also some uneasiness about the throat. Deafness was not simulated. I had no acquaintance with the boy's history, nor with the existence of any motive for fraud; but from his anomalous symptoms, suspicion was at once aroused, although the acting was very perfect. After some sympathy with his condition had been expressed, he was placed under the influence of chloroform; and, although it was pushed almost to a degree of narcotism, I was somewhat surprised to find not the slightest sound uttered by him—a circumstance which I do not remember having previously met with in a patient under chloroform. Confessing myself somewhat disconcerted at the result, I had the patient placed in bed, and a strict watch kept over him, where he lay for twelve hours without touching either food or drink, moaning and pointing to his head, which, at the visits, he tossed on the pillow as if in great agony. At 8 P.M. I visited him, in company with another medical officer; and, as we both felt convinced of his shamming, I suddenly turned down the bedclothes, and gave him such a pinch on the upper and inner side of the thigh—a very safe but sensitive portion of the anatomy, by the way—as made him shriek for mercy. He was discharged from the sick berth, a very sulky prisoner; but next morning, under the influence of a sound flogging, he

made a complete recovery, the vocal organs acting as usual under the circumstances.

**REMARKS.**—That medical officers should never adopt harsh or arbitrary measures in doubtful cases of alleged disease, nor, indeed, apply any means which is inapplicable to a genuine case, is the *dictum* of all writers on malingering; but there are occasional exceptions which, if they do not prove, at least do not invalidate, the rule, and although no doubt whatever may exist in the medical officer's mind, yet a commanding officer or president of a court martial may require something more tangible than a mere opinion before he will convict a prisoner of malingering. We ought never to forget the risk run in attempting such demonstrations; and in dealing with a more experienced vagabond, such treatment is undoubtedly hazardous—the experience of many medical officers being that *le jeu ne vaut pas la chandelle*.

Feigned diseases now form a very small class of cases in Her Majesty's Navy compared with what we read of as having existed in former days. Skulkers, no doubt, exist in every ship; but systematic simulation of disease is remarkably rare, partly owing to our improved knowledge of diagnosis, but chiefly to the fact that the Admiralty now train their own boys, by which means they not only insure a better class of seamen, but also men with more *esprit de corps* than formerly.

## EXTRACTION OF FOREIGN BODIES FROM THE EAR.

By H. A. ALFORD NICHOLLS, M.D., M.R.C.S., Dominica,  
West Indies.

IN the BRITISH MEDICAL JOURNAL of March 18th, there is an article, by Mr. Rivington, on the extraction of foreign bodies from the ear, in which he impresses upon surgeons the usefulness of employing a stream of water in the removal of foreign bodies; and he points out the injuries that may be caused by the unskilful use of instruments in such cases.

Had Mr. Rivington contented himself with dilating upon these facts, he would have done good; but the case is far different when he advises that most useful instruments should be banished from the surgical *armamentarium*, and that, in all instances, the foreign body should be allowed to remain in the ear until syringing effects its removal.

Mr. Rivington says that a small pair of curved forceps may be employed. Surely as great an injury can be caused by these forceps as by a blunt eye. In unskilful hands, the forceps may lacerate the lining membrane of the canal; but, without using great force, it would be difficult to do so with the blunt instrument.

It is within the knowledge of all surgeons that syringing is efficacious in removing many foreign bodies from the ear; but, unfortunately, there are cases, such as the one detailed below, in which syringing will prove of no avail. There are also many instances in which delay may be advantageous, but the converse of this proposition holds equally good.

I have known cases in which a pea, left in the ear, has become swollen, and consequently firmly wedged in the auditory canal. Mr. Rivington would not expect to remove such a body by simple syringing. The imbibition of moisture by the vegetable cells would cause the obstruction, if anything, to increase; and by no means would it be good surgery to wait until the body becomes loosened by the decomposition of its substance. If then, in such a case, we are to discard the useful extracting instruments, because, in the hands of a bungler, they are capable of doing harm, and we find that syringing avail naught, we should be indeed upon the horns of a dilemma. And it would not be very gratifying to us, nor in any way tend to increase our professional reputation, if the patient be taken to another surgeon who, with an extracting instrument, easily removes the obstruction.

Before attempting to extract a foreign body, a surgeon should examine the ear carefully by means of direct light, and, if that fail, the ear speculum should be employed—Brunton's speculum is, I think, the best form made. Then, if nothing foreign be discovered in the ear, no surgeon in his proper senses would think of poking at the malleus.

It is expected, of course, that, in the use of all instruments, there shall be no bungling on the part of the operator, and no injury caused by unskilful manipulation. If proper care be employed, there is no more danger of injuring the ear with an extracting instrument than there is of making a false passage with a catheter. It is true that both these accidents have occurred; and, it may be said, that it is equally true that such accidents will occur again; but these facts do not justify surgeons in discarding instruments for the extraction of foreign bodies from the ear, any more than they justify surgeons in discarding catheters.